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UTILITY PATENT APPLICATION TRANSMITTAL

Only for new nonprovisional applications under 37 CFR 1.53(b)

Attorney Docket No.

PPC-0720

First Named Inventor or Application Identifier

Vincent P. Lasko

Express Mail Label No.

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APPLICATION ELEMENTS

ADDRESS TO:

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 Washington, DC 20231

See MPEP Chapter 600 concerning utility patent application contents.

1. ☒ Fee Transmittal Form (attached hereto in duplicate)
 2. ☒ Specification [Total Pages 12]
 (Preferred arrangement set forth below)

- Descriptive Title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R&D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

- 3.
- ☒
- Drawing(s) [35 USC 113] [Total Sheets 3]

4. Oath or Declaration

- a. ☒ Newly executed (original or copy)
 b. ☐ Unexecuted original
 c. ☐ Copy from a prior application (37 CFR 1.63(d))
 (for continuation/divisional check boxes 5 and 16)
 i. ☐ Deletion of Inventor(s)

Signed statement attached deleting
 inventor(s) named in the prior application,
 see 37 CFR 1.63(d)(2) and 1.33(b).

5. ☐ Incorporation by Reference
 (useable if Box 4c is checked)
 The entire disclosure of the prior application, from
 which a copy of the oath or declaration is supplied
 under Box 4c, is considered as being part of the
 disclosure of the accompanying application and is
 hereby incorporated by reference therein.

6. ☐ Microfiche Computer Program (Appendix)
 7. Nucleotide and/or Amino Acid Sequence
 Submission (if applicable, all necessary)
 a. ☐ Computer Readable Copy
 b. ☐ Paper Copy (identical to computer copy)
 c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ☒ Assignment Papers (cover sheet &
 document(s))
 9. ☐ 37 CFR 3.73(b) Statement
 (when there is an assignee) ☐ Power of Attorney
 10. ☐ English Translation Document (if applicable)
 11. ☒ Information Disclosure Statement
 (IDS)/PTO-1449 ☒ Copies of IDS Citations
 12. ☐ Preliminary Amendment
 13. ☒ Return Receipt Postcard (MPEP 503)
 (Should be specifically itemized)
 14. ☐ Certified Copy of Priority Document(s)
 (if foreign priority is claimed)

- 15.
- ☐
- Other:

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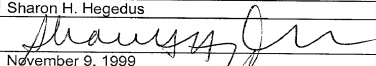
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 Address: Johnson & Johnson
 One Johnson & Johnson Plaza
 New Brunswick, NJ 08933-7003 USA

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Please direct all telephone calls or telefaxes to Sharon H. Hegedus at:
 Telephone: (732) 524-2242 Fax: (732) 524-2808

19. SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

NAME	Sharon H. Hegedus	Reg. No. 33058
SIGNATURE		
DATE	November 9, 1999	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Vincent P. Lasko

For : Nonwoven Material Comprising an Adhesive and Apertures

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Date of Deposit: November 9, 1999

I hereby certify that this complete application, including specification pages, claims, formal drawings, Declaration and Power of Attorney, and Assignment, is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

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NONWOVEN MATERIAL COMPRISING
AN ADHESIVE AND APERTURES

5 The present invention relates to a nonwoven material having apertures and an
adhesive composition disposed in a pattern on surface thereof, a process for making the
same, and absorbent articles comprising the same.

Background of the Invention

10 Many types of nonwoven materials, that is, fibrous nonwoven webs or plastic
films, find useful application in the field of absorbent articles. Such materials may or
may not be apertured, and are often used as covers or backsheets for sanitary napkins,
pantiliners, diapers, incontinence devices and wound dressings. In order to enhance the
functional and aesthetic properties of these materials, they are designed with a variety of
features.

15 For example, U.S. Patent No. 5,906,786 relates to the production of nonwoven
fabrics with fibrous raised portions and fibrous background portions. The basis weights
and densities of the raised and background portions can be adjusted to achieve differing
effects. U.S. Patent No. 5,824,352 describes an apparatus for producing an apertured
plastic film having a tricot-like texture due to a series of peaks and valleys in the film.
20 U.S. Patent No. 5,736,219 relates to a nonwoven fabric having improved absorbent
characteristics. The fabric has three different fiber arrays that are interconnected to
produce a unique fiber distribution in the fabric.

25 Applicant has now discovered that a nonwoven material comprising a
combination of apertures and, in a preferred embodiment patterned land areas, may be
formed by applying an adhesive composition to the nonwoven material and aperturing it.
Such a nonwoven material is particularly useful as a component of an absorbent article.
Advantageously, the nonwoven material may be made with a variety of functional or
aesthetic properties by adjusting the ingredients of the adhesive composition and the
pattern in which it is applied to the nonwoven material.

30

Summary of the Invention

 The invention provides a process for preparing a nonwoven material having a first
surface and a second surface opposite the first surface, which comprises in sequence: a)

applying an adhesive composition to the first surface of the nonwoven material in a pattern; and b) aperturing the adhesive composition-containing nonwoven material.

The invention further provides a nonwoven material comprising: 1) a first surface and a second surface opposite the first surface, 2) an adhesive composition disposed in a pattern on the first surface of the nonwoven material, and 3) a plurality of apertures in said nonwoven material.

The invention also provides an absorbent article comprising a nonwoven material and an absorbent core, said nonwoven material comprising: 1) a first surface and a second surface opposite the first surface, 2) an adhesive composition disposed in a pattern on the first surface of the nonwoven material, and 3) a plurality of apertures in said nonwoven material.

Brief Description of the Drawings

Figure 1 is a cross-sectional view of a nonwoven material according to the invention.

Figure 2 is a top view of the nonwoven material of Figure 1.

Figure 3 is a bottom view of the nonwoven material of Figure 1.

Figure 4 depicts a pantliner comprising a cover made from a nonwoven material according to the invention.

Detailed Description of the Invention

Production of the nonwoven material starts with any textile-like material that is not a woven fabric. In particular, fibrous nonwoven webs that are formed by carding or hydroentangling processes are useful starting materials. Plastic films, such as those comprising polyethylene, polypropylene, or cellophane may also be used. A wide range of examples of fibrous nonwoven webs and plastic films are known and used in the art of absorbent articles, and any of these may be employed. The identity of the starting material is not critical to the invention.

The nonwoven material is made by first applying an adhesive composition to one surface of the nonwoven material in a pattern. The adhesive composition comprises an adhesive such as a solution or emulsion based acrylic polymer synthesized from one or more acrylic or methacrylic ester monomers such as 2-ethylhexyl acrylate, n-butyl acrylate, iso-octyl acrylate, 1-decyl acrylate, acrylic acid, methacrylic acid, N-methylacrylamide, ethyl acrylate, methyl acrylates, methyl methacrylate, ethyl

methacrylate, and butyl methacrylate. Such adhesives may also include vinyl based comonomers such as vinyl acetate, vinyl chloride, styrene, maleic anhydride, and crotonic acid. The adhesives may also be crosslinked via vinyl monomers that contain pendent groups such as amide, carboxyl, hydroxyl, or epoxy functionality.

- 5 Commercially available examples of useful adhesives include FLEXBOND 974, 977, 983, and 986 adhesives available from Air Products, CARBOTAC Adhesives (pressure sensitive adhesives) available from BF Goodrich, and CARBOBOND Adhesives (non-pressure sensitive adhesives) also available from BF Goodrich. Preferably, the adhesive is selected from the group consisting of FLEXBOND 974, 977, 10 983, and 986 adhesives.

- The adhesive composition also preferably comprises an additive for the purpose of enhancing the functional (for example, absorbent) properties of the nonwoven material or effecting the aesthetic nature of the nonwoven material. Such additive may be added to the adhesive composition in solid or liquid form. Preferably, the additive is added to the adhesive composition in solid form, such as in the form of fibers or particles.
- 15 In a particularly preferred embodiment of the invention, the adhesive composition comprises an additive in the form of flocked fibers. Methods of flocking fibers are known in the art of fabric manufacture. See for example, U.S. Patent Nos. 2,527,501; 2,691,611; 3,436,442; and 3,672,929. In the present invention, the flocked fibers are
- 20 added to the adhesive composition after it has been applied to the surface of the nonwoven material. The nonwoven material containing the adhesive composition is passed through a fiber metering station in which an electrostatic field is maintained around the nonwoven material, using for example electrodes situated above and below the nonwoven material. The fibers are applied to the adhesive composition on the nonwoven material in the presence of the electrostatic field, which orients the fibers perpendicular to the nonwoven material as they contact the adhesive composition. The nonwoven material is then heated, polymerizing the adhesive and anchoring the fibers in the adhesive composition. Unattached fibers may be vacuumed away.
- 25 In general, any additive in fiber form may be flocked onto the adhesive composition as described above. Typically, the length of the flocked fibers should be less than about 1 mm, preferably less than about 0.8 mm. The denier of the flocked fibers should be in the range of about 1.2d to about 15d, preferably about 1.8d to about 6d.

Generally, the additive may be selected from hydrophilic materials, including wettable materials and absorbents, hydrophobic materials such as repellants, superabsorbent polymers, pigments, and combinations thereof.

- 5 Examples of wettable materials include bicomponent fibers, polypropylene fibers, and polyester fibers that have been treated for example with surfactants. Preferred wettable materials are polyester fibers, such as DuPont-Akra Polyester Type 11A Bright commercially available from DuPont Company treated with a surfactant such as Tween 20 commercially available from ICI Americas Inc.

- 10 Absorbents both have an affinity for and absorb fluids. Absorbents are typically also used in fiber form, and may comprise rayon, acrylics, nylon, polyvinyl alcohol, and natural or regenerated cellulose. A preferred type of absorbent is rayon fibers.

- Hydrophobic materials include certain olefins and polyesters, preferably used in fiber form and having a denier of at least 3, more preferably at least 6. A preferred hydrophobic fiber is 15 denier polyester commercially available from DuPont Company.
- 15 In another particularly preferred embodiment of the invention, the adhesive composition comprises superabsorbent polymer, which may be in either particle or fiber form. Preferably, the superabsorbent polymer is in fiber form, more preferably in the form of flocked fibers. Superabsorbent polymers are hydrophilic materials that are swellable and capable of absorbing greater than about 5 grams per gram (of fiber weight) of 1% saline solution.
- 20 Examples of superabsorbent polymers are known in the art and include polyacrylates, grafted cellulose, and maleic acid. Preferred types of superabsorbent polymer fibers include OASIS Type 101, commercially available from Technical Absorbents Limited and CAMELOT, commercially available from Camelot, Alberta, Canada. Examples of superabsorbent polymers in particle form include ASAP 2000,
- 25 ASAP 2300, and ASAP 2100A commercially available from Chemdal Corp., Aquakeep J-550 and Aquakeep SA60N type 2 commercially available from Sumitomo, and SXM-4750 commercially available from Stockhausen.

Pigments useful in the adhesive composition include titanium dioxide, calcium carbonate, and other whiteners, for example. Pigments of other colors may also be used.

- 30 The adhesive composition is applied to one surface of the nonwoven material in a pattern. Any pattern may be used. One preferred pattern involves applying the adhesive composition around the perimeter of the surface of the nonwoven material to form a barrier of sorts along the edge of the nonwoven material. For example, an adhesive composition comprising adhesive mixed with hydrophobic material (in fiber or particle

form) applied around the perimeter of the surface of the nonwoven material decreases fluid flow across the adhesive composition, thereby preventing fluid flow off the edge of the nonwoven material.

- Other patterns for application of the adhesive composition may be partially or fully decorative, such as a pattern of individual flowers, stars, etc. dispersed over all or part of the surface of the nonwoven material.

- The adhesive composition is then cured, typically by the application of heat. After curing of the adhesive composition, the nonwoven material is apertured. The invention is not limited to any particular aperturing process. Aperturing of nonwoven materials is well known in the art, and any technique may be used according to the invention. Generally speaking, a starting material, in this case the nonwoven material comprising the adhesive composition, is placed over the surface of a support member comprising a plurality of holes, and optionally other topographical features. High pressure fluid such as water or air is then directed against the nonwoven material, which causes it to conform to the topography of the support member. Alternatively, a vacuum may be drawn from underneath the support member, also causing the nonwoven material to conform to the surface of the support member. U.S. Patent Nos. 4,342,314, 5,366,782, 5,916,462 and 5,824,352 disclose the aperturing process and a variety of support members in greater detail.

- Aperturing may be done so that the apertures originate in the surface of the nonwoven material on which the adhesive composition has been applied. Alternatively, the apertures may originate on the surface of the nonwoven material that is opposite to the surface on which the adhesive composition has been applied. Preferably, the apertures originate on the surface of the nonwoven material that is opposite to the surface on which the adhesive composition has been applied. Apertures "originate" in a surface of a planar material when their sidewalls protrude away from such surface, projecting outward from the opposite surface.

- Aperturing of the nonwoven material may be performed as desired such that holes are or are not also formed in the areas of the nonwoven material in which the adhesive composition has been applied. Preferably, aperturing is performed such that holes are not formed in the areas of the nonwoven material in which the adhesive composition has been applied. In this manner, the pattern in which the adhesive composition has been applied is substantially maintained. Indeed, the pattern of the adhesive composition may even be enhanced by aperturing without forming holes in the areas in which the adhesive

composition has been applied. Depending on the temperature of the nonwoven material and the pressure exerted against the nonwoven material during the aperturing step, the areas of the nonwoven material containing the adhesive composition may actually become raised relative to the areas not containing adhesive composition.

- 5 Advantageously, an overall effect similar to embossing is achieved and functional and/or decorative patterns may be imparted to an apertured film using relatively straightforward techniques.

Figure 1 shows a cross-sectional view of a nonwoven material according to the invention in which aperturing has been performed without producing holes in the areas in
10 which the adhesive composition has been applied. The nonwoven material of Figure 1 comprises a plastic film 10 having a first surface 11 and a second surface 12 with an adhesive composition 8 disposed in a pattern on the first surface 11 thereof. The adhesive composition contains adhesive with flocked fibers 14 of an additive such as a superabsorbent polymer projecting therefrom. The plastic film 10 also contains a
15 plurality of apertures 9. The apertures 9 originate in the second surface 12 of the plastic film 10.

Figure 2 is a top view of the nonwoven material of Figure 1. The second surface 12 of the plastic film 10 comprises a series of small land areas surrounding the apertures 9. In addition, a large land area 15 is present where the adhesive composition has been
20 applied to the first surface 11 (not shown).

Figure 3 shows a bottom view of the nonwoven material of Figure 1. The sidewalls of the apertures 9 project outward from the first surface 11 of the plastic film 10. The flocked fibers 14 also project outward from the adhesive composition and the first surface 11.

- 25 The nonwoven material may be used in an absorbent article, for example as a cover or a backsheet. Such absorbent article may be a sanitary napkin, a pantiliner, a diaper, incontinence pad, interlabial article, or other similar product for absorbing exudates from the body, such as menses, urine, or feces. Preferably, the absorbent article is a sanitary napkin or a pantiliner. Such sanitary napkin or pantiliner may have an
30 approximately rectangular, oval, dogbone, or peanut shape. Depending on the nature of the absorbent article, its size may vary. For example, sanitary napkins typically have a caliper of about 1.4 to about 5 mm, a length of about 3 to about 16 inches, and a width of about 1 to about 5 inches. Pantliners typically have a caliper of less than about 0.2 inches, a length of less than about 8 inches, and a width of less than about 3 inches.

Figure 4 depicts a pantliner in which the cover is a nonwoven material according to the invention, and is used for purposes of illustration in the following description. The pantliner shown in Figure 4 comprises in sequence from its body-facing surface 1 to its garment-facing surface 2 liquid permeable cover 3, an absorbent core 4, and a liquid impermeable backsheet 5. The cover 3 of the absorbent article is made from a plastic film that comprises an adhesive composition 8 and a plurality of apertures 9. In this case, the adhesive composition is disposed in a pattern of rails and flowers on the side of the cover 3 facing the absorbent core 4. The apertures 9 originate in the body-facing surface 1 of the cover and project downward towards the absorbent core 4.

In general, the thickness of the cover 3 may vary from approximately 0.001 to 0.062 inch, depending on the material chosen. The cover may be the same length, or optionally longer than the absorbent core so as to form transverse ends. Such transverse ends may be sealed with other layers to fully enclose the absorbent core.

The absorbent core 4 may be comprised of a loosely associated absorbent hydrophilic material such as cellulose fibers, including wood pulp, regenerated cellulose fibers or cotton fibers, or other absorbent materials generally known in the art, including acrylic fibers, polyvinyl alcohol fibers, peat moss and superabsorbent polymers.

The absorbent article further comprises a liquid impermeable backsheet 5, the exterior of which forms the garment-facing surface 2 of the article. The backsheet may comprise any thin, flexible, body fluid impermeable material such as a polymeric film, for example, polyethylene, polypropylene, or cellophane. Alternatively, the backsheet may be a normally fluid permeable material that has been treated to be impermeable, such as impregnated fluid repellent paper or non-woven fabric material, or a flexible foam, such as polyurethane or cross-linked polyethylene. The thickness of the backsheet when formed from a polymeric film typically is about 0.001 to 0.002 inch. A variety of materials are known in the art for use as backsheet, and any of these may be used.

Generally, the backsheet 5 is a single sheet of material having a width sufficient to form the garment-facing surface 2 of the absorbent article. The backsheet may extend around the sides of the absorbent core in a C-shaped configuration with the portions of the backsheet adjacent its longitudinal edges extending upwardly from the garment-facing surface toward the body-facing surface of the article. Preferably the backsheet is breathable, i.e., a film that is a barrier to liquids but permits gases to transpire. Materials for this purpose include polyurethane films and microporous films in which microporosity is created by ionizing radiation or by leaching out of soluble inclusions

using aqueous or nonaqueous solvents. Single or multiple layers of permeable films, fabrics, and combinations thereof that provide a tortuous path, and/or whose surface characteristics provide a liquid surface repellent to the penetration of liquids may also be used to provide a breathable backsheet.

- 5 The absorbent article may be applied to the crotch of underpants by placing the garment-facing surface 2 of the absorbent article against the inside surface of the crotch of the underpants. Strips of pressure sensitive adhesive 6 may be applied to the garment-facing surface 2 of the absorbent article to help maintain it in place. As used herein, the term "pressure-sensitive adhesive" refers to any releasable adhesive or releasable
- 10 tenacious means. Suitable pressure sensitive adhesives include for example water-based adhesives such as acrylate adhesives. Alternatively, the adhesive may comprise rapid setting thermoplastic "hot melt" rubber adhesives or two-sided adhesive tape.

- A paper release strip 7 that has been coated on one side may be applied to protect the strips of adhesive 6 prior to use. The coating, for example silicone, reduces adherence
- 15 of the coated side of the release strip to the adhesive. The release strip can be formed from any suitable sheet-like material which, when coated, adheres with sufficient tenacity to the adhesive to remain in place prior to use but can be readily removed when the absorbent article is to be used.

- The absorbent article may comprise other known materials, layers, and additives,
- 20 such as transfer layers, foam layers, net-like layers, odor control agents, perfumes, medicaments, moisturizers, and the like, many examples of which are known in the art.

Example

- A nonwoven material is made according to the invention as follows. A sample of
- 25 polyester fabric or polyethylene film is used as the starting material. An adhesive composition containing titanium dioxide is applied to one surface of the starting material in a pattern of flowers and rails, similar to the pattern shown in Figure 4. Flocked fibers of superabsorbent polymer and polyester are metered onto the adhesive composition and then oriented in the vertical position via an electrostatic field. The fibers adhere where
- 30 the adhesive composition has been applied. The material is then passed through an oven to polymerize the adhesive composition, anchoring the flocked fibers thereto. Excess fibers are vacuumed away.

Next, the material is apertured using hot air aperturing. The apertures originate in the surface of the material opposite to the one on which the adhesive composition has

been applied. The temperature of the nonwoven material and the pressure of the hot air against the surface of the nonwoven material are adjusted so that apertures are not formed in the flowers and rails of the adhesive composition. The overall look and feel of the finished nonwoven material resembles a combination of apertures and embossed land areas.

5

I claim:

1. A process for preparing a nonwoven material having a first surface and a second surface opposite the first surface, which comprises in sequence: a) applying an
5 adhesive composition to the first surface of the nonwoven material in a pattern; b) curing the adhesive composition, and c) aperturing the adhesive composition-containing nonwoven material.
2. The process of claim 1, wherein said aperturing forms a plurality of
10 apertures originating in the second surface of the nonwoven material.
3. The process of claim 1, wherein the nonwoven material is a fibrous nonwoven web or a plastic film.
- 15 4. The process of claim 1, wherein the adhesive composition comprises an additive selected from the group consisting of hydrophilic materials, hydrophobic materials, superabsorbent polymers, pigments, and combinations thereof.
- 20 5. A nonwoven material made by the process of claim 1.
6. A nonwoven material comprising: 1) a first surface and a second surface opposite the first surface, 2) an adhesive composition disposed in a pattern on the first surface of the nonwoven material, and 3) a plurality of apertures in said nonwoven material.
25
7. The nonwoven material of claim 6, wherein said apertures originate in the second surface of the nonwoven material.
8. The nonwoven material of claim 6, wherein the nonwoven material is a
30 fibrous nonwoven web or a plastic film.
9. The nonwoven material of claim 6, wherein the adhesive composition comprises an additive selected from the group consisting of hydrophilic materials, hydrophobic materials, superabsorbent polymers, pigments, and combinations thereof.

10. An absorbent article comprising a nonwoven material and an absorbent core, said nonwoven material comprising: 1) a first surface and a second surface opposite the first surface, 2) an adhesive composition disposed in a pattern on the first surface of
5 the nonwoven material, and 3) a plurality of apertures in said nonwoven material.
11. The absorbent article of claim 10, wherein said apertures originate in the second surface of the nonwoven material.
- 10 12. The absorbent article of claim 10, wherein the nonwoven material is a fibrous nonwoven web or a plastic film.
13. The absorbent article of claim 10, wherein the adhesive composition comprises an additive selected from the group consisting of hydrophilic materials,
15 hydrophobic materials, superabsorbent polymers, pigments, and combinations thereof.
14. The absorbent article of claim 10, wherein said nonwoven material is the cover of the absorbent article.
- 20 15. The absorbent article of claim 10, wherein said nonwoven material is the backsheet of the absorbent article.

ABSTRACT

A nonwoven material, such as a fibrous nonwoven web or a plastic film is provided, which is made by applying adhesive in a pattern on one side thereof, and then
5 aperturing the nonwoven material.

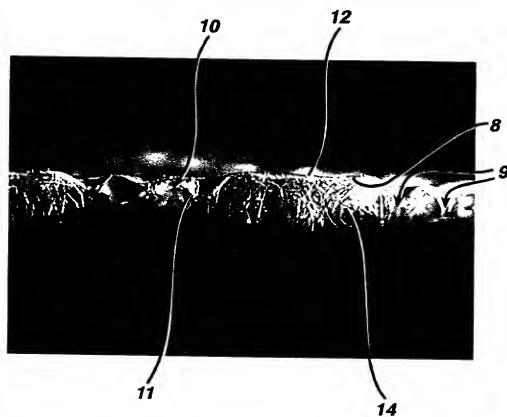
FIG. 1

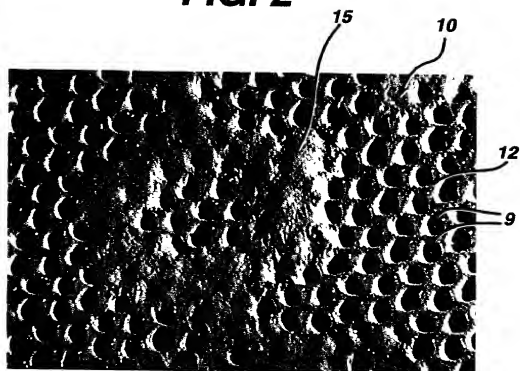
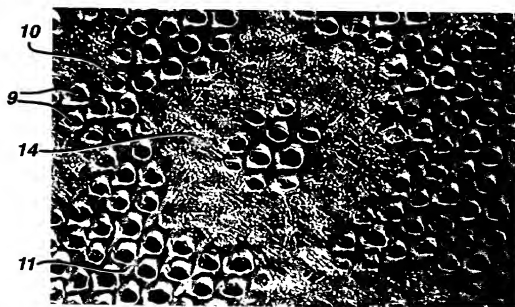
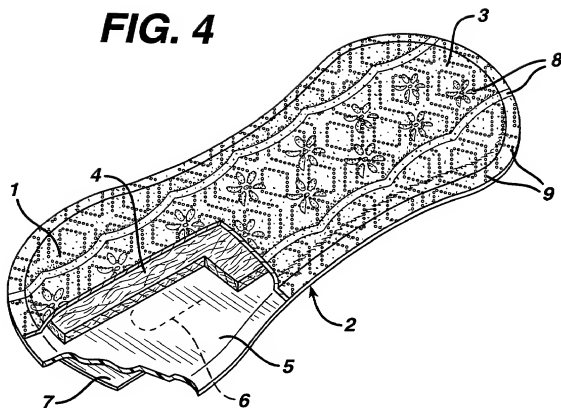
FIG. 2**FIG. 3**

FIG. 4

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled Nonwoven Material Comprising an Adhesive and Apertures, the specification of which

(check one) ☒ is attached hereto.

☐ was filed on _____ as

Application Serial No. _____

and was amended on _____.
(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s):

Country	Application Number	Date of Filing	Priority Claimed Under 35 U.S.C. 119	
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			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

(Application Number)

(Filing Date)

(Application Number)

(Filing Date)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No. Filing Date Status

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I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith as well as to file equivalent patent applications in countries foreign to the United States including the filing of international patent applications in accordance with the Patent Cooperation Treaty: Audley A. Ciamporzero, Jr. (Reg. #26,051), Steven P. Berman (Reg. #24,772), Andrea L. Colby (Reg. #30,194), Michael Stark (Reg. #32,495), and Sharon H. Hegedus (Reg. #33,058) One Johnson & Johnson Plaza, New Brunswick, NJ 08933.

Address all telephone calls to Sharon H. Hegedus at telephone no. (732) 524-2242.

Address all correspondence to Audley A. Ciamporzero, Jr., One Johnson & Johnson Plaza, New Brunswick, NJ 08933-7003.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor's Signature:

Full Name of First Inventor

Vincent P. Lasko
Vincent P. Lasko
Date: 11/3/89

Citizenship: US

Residence: 114 Holly Hill Dr., New Egypt, NJ 08533

Post Office Address: same